

Claims

[c1] 1. A lenticular bar code image comprising:
a lenticular lens having a front surface including a plurality of lenticules and a back surface opposite the front surface; and
an image joined to the back surface of the lens, the image including a bar code symbol having bars;
wherein the lenticular lens and the image are in overlay relationship with one another such that a lenticular bar code angle is formed between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c2] 2. The lenticular bar code image of Claim 1 wherein the lenticular bar code angle is in a range from 0 to 360 degrees.

[c3] 3. The lenticular bar code image of Claim 1 wherein the lenticular bar code angle is in a range from 0 to 90 degrees.

[c4] 4. The lenticular bar code image of Claim 1 wherein the bars of the bar code symbol are skewed with respect to the lenticules of the lenticular lens.

[c5] 5. The lenticular bar code image of Claim 1 wherein the bars of the bar code symbol are perpendicular to the lenticules of the lenticular lens.

[c6] 6. The lenticular bar code image of Claim 1 wherein the bars of the bar code symbol are not aligned with the lenticules of the lenticular lens.

[c7] 7. The lenticular bar code image of Claim 1 wherein the bar code symbol is readable through the lenticules of the lenticular lens by a bar code reader.

[c8] 8. The lenticular bar code image of Claim 7 wherein the bar code reader is a scanner.

[c9] 9. The lenticular bar code image of Claim 7 wherein the bar code reader is one of: a contact reader, a moving beam scanner, a fixed beam scanner, and a hand-held scanner.

[c10] 10. The lenticular bar code image of Claim 7 wherein the bar code symbol has an ANSI readability grade of at least a C.



- [c11] 11.The lenticular bar code image of Claim 1 wherein the bar code symbol is a Universal Product Code (UPC) symbology.
- [c12] 12.The lenticular bar code image of Claim 1 wherein the lenticules of lenticular lens have a width of less than about 0.006667 inches.
- [c13] 13.The lenticular bar code image of Claim 12 wherein the lenticules of lenticular lens have a focal length and a gauge thickness and wherein the focal length is substantially equal to the gauge thickness.
- [c14] 14.The lenticular bar code image of Claim 13 wherein the gauge thickness is less than about 10 mils.
- [c15] 15.The lenticular bar code image of Claim 1 wherein the lenticular lens includes at least 150 lenticules per inch (LPI).
- [c16] 16.The lenticular bar code image of Claim 1 wherein the bar code symbol is one of a Code 39 symbology, an Interleaved 2 of 5 symbology, a Codabar symbology, a Code 128 symbology, a Code 93 symbology, and a Postnet symbology.
- [c17] 17.The lenticular bar code image of Claim 1 wherein at least one of the plurality of lenticules overlays more than one bar of the bar code symbol.
- [c18] 18.The lenticular bar code image of Claim 1 wherein the image is printed directly to the back surface of the lenticular lens.
- [c19] 19.The lenticular bar code image of Claim 1 wherein the image is printed onto the lenticular lens by one of: sheet-fed printing, web-offset printing, flexographic printing, gravure printing, digital printing, and electronic deposition.
- [c20] 20.The lenticular bar code image of Claim 1 wherein the image is not printed onto the lenticular lens by a photographic printing process.
- [c21] 21.The lenticular bar code image of Claim 1 wherein the image is printed onto the lenticular lens by one of: sheet-fed printing, web-offset printing, flexographic printing, gravure printing, digital printing, inkjet and electronic

deposition.

[c22] 22.The lenticular bar code image of Claim 1 further comprising a substrate such that the image is disposed between the lenticular lens and the substrate.

[c23] 23.The lenticular bar code image of Claim 22 further wherein the image is printed to the substrate.

[c24] 24.The lenticular bar code image of Claim 23 wherein the image is printed onto the substrate by one of: sheet-fed, web-offset, flexographic, gravure, digital printing, inkjet and electronic deposition.

[c25] 25.The lenticular bar code image of Claim 1 wherein the lens comprises an ultraviolet curable resin and a plastic material selected from the group consisting of: polyester vinyl, polycarbonate, polyvinyl chloride, polyethylene terephthalate, and amorphous polyethylene terephthalate.

[c26] 26.The lenticular bar code image of Claim 1 wherein the lens comprises an ultraviolet curable resin.

[c27] 27.The lenticular bar code image of Claim 1 wherein the lens comprises thermoplastic material.

[c28] 28.The lenticular bar code image of Claim 1 wherein the lens comprises plastic material.

[c29] 29.The lenticular bar code image of Claim 1 wherein the lens comprises electron beam, curable resin material.

[c30] 30.The lenticular bar code image of Claim 1 wherein the lenticular bar code image is applied to at least one of: a package, a cup, a container, and a label.

[c31] 31.A lenticular bar code image comprising:
a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
an image joined to the flat back surface of the lens, the image including a UPC bar code symbol having bars;
wherein the lenticular lens and the image are in overlay relationship with one

another such that a lenticular bar code angle is formed between the bars of the bar code symbol and the lenticules of the lenticular lens such that the bars are substantially perpendicular to the lenticules.

[c32] 32.A lenticular bar code image comprising:

- a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
- an image lithographically printed directly to the flat back surface of the lens, the image including a UPC bar code symbol having bars;
- wherein the lenticular lens and the image are in overlay relationship with one another such that a lenticular bar code angle is formed between the bars of the bar code symbol and the lenticules of the lenticular lens such that the bars are substantially perpendicular to the lenticules; and
- wherein the bar code symbol is readable through the lenticules of the lenticular lens by a bar code reader.

[c33] 33.A lenticular bar code image comprising:

- a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
- an image lithographically printed directly to the flat back surface of the lens, the image including a UPC bar code symbol having bars;
- wherein the lenticular lens and the image are in overlay relationship with one another such that a lenticular bar code angle is formed between the bars of the bar code symbol and the lenticules of the lenticular lens such that the bars are substantially perpendicular to the lenticules;
- wherein the bar code symbol is readable through the lenticules of the lenticular lens by a bar code reader; and
- wherein the bar code symbol remains substantially visible despite any movement of the lenticular bar code image.

[c34] 34.A label comprising:

- a label substrate; and
- a lenticular bar code image attached to the label substrate, the lenticular bar code image comprising:

a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
an image joined to the flat back surface of the lens, the image including a bar code symbol having bars ;
wherein the bar code symbol is rotated to define a bar code rotation angle between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c35] 35.A container comprising:
a container substrate; and
a lenticular bar code image attached to the container substrate, the lenticular bar code image comprising:
a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
an image joined to the flat back surface of the lens, the image including a bar code symbol having bars ;
wherein the bar code symbol is rotated to define a bar code rotation angle between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c36] 36.A cup comprising:
a cup substrate; and
a lenticular bar code image attached to the cup substrate, the lenticular bar code image comprising:
a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
an image joined to the flat back surface of the lens, the image including a bar code symbol having bars ;
wherein the bar code symbol is rotated to define a bar code rotation angle between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c37] 37.A package comprising:
a package substrate; and

a lenticular bar code image attached to the package substrate, the lenticular bar code image comprising:

a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and

an image joined to the flat back surface of the lens, the image including a bar code symbol having bars ;

wherein the bar code symbol is rotated to define a bar code rotation angle between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c38] 38.A method of making a lenticular bar code image, the method comprising:
providing a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface;
providing a lenticular bar code image, the image including a bar code symbol having bars; and
joining the lenticular bar code image to the flat back surface of the lens, thereby creating a bar code offset angle between the bars of the bar code symbol and the lenticules of the lenticular lens.

[c39] 39.The method of Claim 38 wherein the lenticules are not parallel to the spaced apart elements of the bar code.

[c40] 40.The method of Claim 38 wherein the lenticules are normal to the spaced apart elements of the bar code.

[c41] 41.A method of reading a lenticular bar code image, the method comprising:
providing a lenticular bar code image, the lenticular bar code image comprising:
a lenticular lens having a front surface including a plurality of lenticules and a back surface opposite the front surface; and
an image joined to the back surface of the lens, the image including a bar code symbol having bars;
wherein the lenticular lens and the image are in overlay relationship with one another such that a lenticular bar code angle is formed between the bars of the bar code symbol and the lenticules of the lenticular lens; and
reading the lenticular bar code image through the lenticules of the lenticular

lens with a bar code reader.

[c42] 42.A lenticular image comprising:

- a lenticular lens having a front surface including a plurality of lenticules and a flat back surface opposite the front surface; and
- an image joined to the flat back surface of the lens, the image including a readable product identifier;
- wherein the readable product identifier rotated to define a readable product identifier angle between the bars of the bar code symbol and the lenticules of the lenticular lens.